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Our Case No. 10420/15

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Imundo et al.

Serial No. 09/853,945

Filing Date: May 11, 2001

For: Process for Repairing a Structure

Examiner: Jermie E. Cozart

Group Art Unit No. 3726

REQUEST FOR REINSTATEMENT OF APPEAL AND APPEAL BRIEF

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Applicants request that the appeal in this case be reinstated, and have prepared this supplemental appeal brief. This Appeal Brief is being filed in response to an Office Action mailed on June 15, 2005, and in accordance with the Notice of Appeal filed on September 15, 2005. Because a Notice of Appeal and an Appeal Brief were previously filed in this case, only the fee for a two-month extension of time is believed to be due, according to M.P.E.P. 1208.02.

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This is an appeal from the rejections in the Office Action mailed on June 15, 2005 for the application of Michael L. Imundo et al., and is filed with a request for a two-month extension of time. Because the claims in the present application have been rejected at least twice before, and have now been again rejected, Appellants request reinstatement of the appeal.

I. Real Party in Interest

The real party in interest is the assignee, United Air Lines, Inc.

II. Related Appeals and Interferences

There are no related appeals or interferences that would affect, be affected by, or have a bearing upon, the Board's decision in the present appeal in this application.

III. Status of Claims

Claims 1-22 are pending in this application. Claims 1, 2, 4, 5, 7, 9, 10, 12, 13, 15, 16, 18, 20, and 21 are rejected under 35 U.S.C. § 103(a) as unpatentable in view of U.S. Pat. No. 5,913,555 to Karl-Hermann Richter et al. ("Richter") in view of U.S. Pat. No. 5,285,397 to Helmut Heier et al. ("Heier"). Claims 3 and 14 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Pat. No. 5,913,555 to Karl-Hermann Richter et al. ("Richter") in view of U.S. Pat. No. 5,285,397 to Helmut Heier et al. ("Heier") and further in view of Applicants' Appeal Brief. Claims 8, 11, 19 and 22 are rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Pat. No. 5,913,555 to Karl-Hermann Richter et al. ("Richter") in view of U.S. Pat. No. 5,285,397 to Helmut Heier et al. ("Heier") and further in view of U.S. Pat. No. 5,736,201 to Mary Flint ("Flint").

Claims 6 and 17 have been objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent format including all limitations of the base claim and any intervening claims. Claims 6 and 17 do not form part of the present appeal.

IV. Status of Amendments

The last Amendment filed in this case was mailed by Appellants on August 18, 2003, in response to the final rejection mailed June 18, 2003. An advisory action mailed on September 2, 2003 advised that the amendment was refused entry because it raised new issues that would require further consideration and/or searching. A Request for Reconsideration of the Amendment was filed on September 17, 2003. An Advisory Action was mailed on September 29, 2003, advising that the amendment would not be entered because it raised new issues that would require further consideration and/or searching. The Office Action mailed on June 15, 2005 advised that Appellants were entitled to request reinstatement of the previous appeal. No other amendments are pending.

V. Summary of the Claimed Subject Matter

The invention relates to a process for repairing a structure. The process includes setting up a single measuring device to measure the part or portion of the structure to be repaired. Specification, p. 3, lines 5-6. The device for measuring is desirably a multi-axis measuring machine, having linear axes or rotary axes of motion. Specification, p. 3, lines 6-7. The device is set up and oriented so that the measuring device may measure and digitize data for the portion of the structure to be repaired. Specification, p. 3, lines 12-14. The method will work for parts in three dimensions, that is, parts requiring a length, width and depth in Cartesian coordinates, or parts that may be more conveniently measured in spherical or cylindrical coordinate systems. Specification, p. 3, lines 20-23.

The process preferably uses reference features on the structure to be repaired for orientation of the measuring device. Specification, p. 6, lines 11-12. In one example, a bulkhead station for a Boeing 737 aircraft has two orienting rivet holes just forward of the bulkhead and on the bottom skin of the aircraft which may be used to orient the measuring device. Specification, p. 6, lines 12-15. These points may serve as datums or points for orientation in measuring the part that needs to be repaired or replaced. Specification, p. 6, lines 15-18.

The device then measures the appropriate portion and stores the data in a convenient format. The data may be saved to an internal drive, or may be transferred to an external drive or even another computer. Specification, p. 3, lines 15-18. The data is then used to program at least one machine tool and automatically manufacture the needed repair part. Specification, p. 3, lines 18-20.

The measuring device is desirably a multi-axis coordinate measuring machine having at least one linear axis, and preferably having at least one rotary axis, and a probe. Specification, p. 5, lines 10-12. A preferred device has six axes of motion, three linear and three rotary. Specification, p. 5, lines 12-14.

The measuring device preferably uses a probe, such as a standard Renishaw probe or a laser probe, to measure points on the structure to be repaired. Specification, p. 5, lines 21-26. A user uses the probe to measure the part and then saves the data gathered. Specification, p. 5, line 30, to p. 6, line 3. The user then uses the data to manufacture the repair part using conventional manufacturing processes. Specification, p. 6, lines 3-9. The user then installs the repair part on the structure in need of repair. Specification, p. 6, line 10. The process is useful for repairing structures, which may include sheet-metal structures. Specification, p. 3, lines 25-32.

VI. Grounds of Rejection to be Reviewed on Appeal

The grounds of rejection to be reviewed on appeal are as follows:

1) the rejection of Claims 1, 2, 4, 5, 7, 9, 10, 12, 13, 15, 16, 18, 20, and 21 under 35 U.S.C. § 103(a) as unpatentable in view of U.S. Pat. No. 5,913,555 to Karl-Hermann Richter et al. ("Richter") in view of U.S. Pat. No. 5,285,397 to Helmut Heier et al. ("Heier");

2) the rejection of Claims 3 and 14 under 35 U.S.C. § 103(a) as unpatentable in view of U.S. Pat. No. 5,913,555 to Karl-Hermann Richter et al. ("Richter") in view of U.S. Pat. No. 5,285,397 to Helmut Heier et al. ("Heier") and further in view of Appellants' appeal brief; and

3) the rejection of Claims 8, 11, 19 and 22 under 35 U.S.C. § 103(a) as unpatentable over U.S. Pat. No. 5,913,555 to Karl-Hermann Richter et al.("Richter")

in view of U.S. Pat. No. 5,285,397 to Helmut Heier et al. ("Heier") and further in view of U.S. Pat. No. 5,736,201 to Mary Flint ("Flint").

VII. Argument

iv. Rejections under 35 U.S.C. § 103(a). Arguments concerning the error in final rejections of the claims are presented in the order of the rejections. All references to the "office action" refer to the office action mailed on June 15, 2005.

Claims 1, 4, 5, 7, 12, 15, 16, and 18

Claims 1 and 12 have been rejected under 35 U.S.C. § 103(a) as being unpatentable in view of U.S. Pat. No. 5,913,555 to Karl-Hermann Richter ("Richter") and further in view of U.S. Pat. No. 5,285,397 to Helmut Heier et al. ("Heier"). The rejection states that Richter discloses a method for repairing a sheet metal portion of a structure, wherein a multi-axis digital measuring device is oriented. Office Action, mailed June 15, 2005, p. 2, lines 24-25. The rejection states that the device captures the image of the structure in at least two dimensions in order to reproduce a repair part. The Office Action also states that Richter discloses measuring at least a portion of the structure with the digital imaging device, saving the data generated in measuring the structure, and using the data to manufacture a repair part. Final Office Action, p. 3, lines 1-4. The rejection cites to col. 4, lines 38-59 of Richter for support.

The Office Action admits that Richter does not disclose whether the digital measuring device (the camera) is a multi-axis digital measuring device, as required by Claim 1, and then cites Heier as disclosing a multi-axis digital measuring device. Office Action, p. 3, lines 17-18, and page 4, line 1. The rationale for combining the references is that it would have been obvious to provide the digital measuring device of Richter "as a multi-axis digital measuring device" in light of the teachings of Heier "in order to effectively record horizontal optical intersects of a given work piece at different heights." Office Action, p. 4, lines 10-12 and 15-17. This motivation is insufficient to justify combining the references. In addition, the rejection also fails to make out a prima facie rejection because the Office Action has not analyzed the

references sufficiently to make a showing that the combination has a reasonable expectation of success. M.P.E.P. 2143.02 at 2100-138 (8th ed. Rev. 3).

There is insufficient motivation to combine the references

In order to combine references, there must be some suggestion or motivation, in the references themselves or in the knowledge generally available to one of ordinary skill in the art. M.P.E.P. 2143 at 2100-135 (8th ed. Rev. 3). The rejection admits that Richter does not disclose the claimed multi-axis digital measuring device and then states that it would have been obvious to combine Richter with Heier "in order to effectively record horizontal optical intersects of a given work-piece at different heights." Office Action, p. 4, lines 10-17.

Richter, however, states that in the operation of his system, a digital camera captures an image of a blade at a particular height h, and then uses this information to prepare a repair part "in the form of a sheet or a plate having a proper thickness d so that the total height of the blade after being repaired will correspond" to the desired height. Richter, col. 4, lines 45-59. Thus, Richter achieves his repair by making a single image of a blade at a particular height. Richter has no need for recording horizontal optical intersects at different heights. Therefore, there is no need, or suggestion, to combine Heier with Richter.

Appellants submit that there is insufficient rationale for combining the references. Accordingly, the Office Action fails to make out a prima facie case of obviousness.

The combined references do not disclose all the limitations of Claims 1 and 12

Ordinarily, a claim using the article "a" or "an" will carry the meaning of "one or more."[1] This presumption is rebutted, however, if the specification does not indicate that the inventors intended for the word to have other than its normal, singular meaning.[2] This is particularly true if the claims themselves repeatedly refer to the

[1] *Scanner Techs. Corp. v. ICOS Vision Systems Corp.*, 365 F.3d 1299, 1304 (Fed. Cir. 2004).
[2] *North Am. Vaccine, Inc., v. Am. Cyanamid Co.*, 7 F.3d 1571 (Fed. Cir. 1993).

singular nature of the limitation, as by repeated reference to "the limitation" or "said limitation" rather than "a limitation."[3]

In the present case, the specification refers repeatedly to the use of a single measuring device. See specification, p. 3, lines 5-6, stating, "the method includes setting up a measuring device to measure the part or portion to be repaired." While the term "device" is not defined in the specification, one reasonable interpretation of a device is "a piece of equipment or a mechanism designed to serve a special purpose or perform a special function." Merriam-Webster's Collegiate Dictionary, 10th ed. at 317. Thus, a single device, equipped with multiple axes, is claimed as a "multi-axis" digital measuring device.

See also Fig. 4, depicting a single multi-axis measuring device 40 in a single housing, and described at p. 5, lines 9-12. In the claims, method Claim 1 recites "a multi-axis digital measuring device," and refers to it as being used in the second step of the method, "measuring at least a portion of the structure with the device." Even dependent claims 5 and 11 refer to "the device," while claims 6 and 17 only make sense if the recited mounting bracket refers to a single "multi-axis device." Thus, Claim 1 is properly construed to require a single multi-axis digital measuring device. A multi-axis device inherently includes multiple axes, obviating the need for more than one device to accomplish multi-axis measuring. In addition, the specification refers repeatedly to a single device and the claims refer to "the device," rather than to more than one device, or to "at least one device."

The rejection admits that Richter does not disclose a multi-axis digital measuring device. Office Action, p. 3, lines 17-18. Heier, which was relied on by the Examiner, does not disclose "a multi-axis digital measuring device," but instead a coordinate measuring machine (CMM) which requires four multi-axis digital cameras in four widely separated housings, as seen in Fig. 1 of Heier. Each camera must be oriented via an articulating head with a provision for selective rotation about each of two orthogonally related axes. Abstract, lines 3-7. As noted in the Office Action, the CMM must also include software to interpret the stored calibration data and the

[3] *Abtox. Inc., v. Exitron Corp.*, 122 F.3d 1019, 1024 (Fed. Cir 1997).

angular position data for each rotary axis of each head (camera) in order to derive orientation data and thus calculate the coordinates of each measured point on the object which is being measured. Abstract, lines 12-20.

Thus, to measure an object, Heier requires four digital cameras and four articulating heads, each with its own housing, in four widely-spaced locations, each head having a provision for selective rotation about each of two orthogonally related axes. In addition, software must be provided to measure optical intersects of the given work piece at the desired heights or locations on the work piece. Office Action, p. 4, lines 15-17, and Heier, col. 3, lines 17-22. In other words, Heier requires at least two of the cameras, with two housings and two locations, to generate intercepts and thus to work for their intended purpose. Without two cameras and their housings, and optical intercepts, Heier's CMM will not work. Thus, Heier does not teach or suggest "a multi-axis digital measuring device" as claimed, but "at least two" such devices. In addition, Heier suggests the use of different cameras with different focal lengths or with different operating distances adapted to the objects to be measured. Heier, col. 4, line 67, to col. 5, line 2. Heier advocates a plurality of devices, in a plurality of housings, rather than a single device.

<u>The Office Action is silent on whether the combination of Richter and Heier has a reasonable expectation of success</u>

The Manual of Patent Examining Procedure (M.P.E.P.) is very clear on the three requirements for a prima facie rejection under 35 U.S.C. § 103(a). One of the requirements is that the combination of references must have a reasonable expectation of success. The Office Action for the present application is silent on this requirement. Applicants cannot discern in the Office Action any analysis showing that the combination of Richter and Heier has a reasonable chance of success. Applicants submit that the Office Action has therefore failed to present a prima facie rejection for obviousness.

The Office Action admits that Richter does not disclose a multi-axis digital measuring device; we have seen that Heier also does not disclose a single multi-axis digital measuring device as claimed, but instead requires at least two such devices.

Accordingly, the references do not disclose at least this limitation of Claims 1 and 12. The rejection of Claim 1 is therefore improper because there is insufficient motivation to combine the references, and because even the combined references do not teach or suggest the inventions recited in Claims 1 and 12. Finally, the rejection is incomplete and does not make out a prima facie case of obviousness because the rejection does not analyze the combination for a likelihood of success. Claims 1 and 12 are therefore allowable. Dependent Claims 2-5, 7-11, 13-16, and 18-22 are allowable at least because Claims 1 and 12 are allowable.

Claims 2 and 13

Claims 2 and 13 are rejected as anticipated by Richter and Heier. As already discussed above, Applicants submit that there is no legally sufficient reason for combining Richter and Heier, and the Office Action fails to analyze the combination for a reasonable chance of success. As discussed herein, even the improper combination does not disclose all the limitations of Claims 2 and 13.

As stated in the Office Action, p. 3, lines 17-19, Richter does not explicitly disclose adding additional data for use in automatically manufacturing the repair part. As also stated in the Office Action, p. 4, lines 1-3, Heier allegedly discloses adding additional data "i.e., position measurement values, angular measurement values."

The meaning of "additional data" appears in the specification, on pp. 8 and 12. In referring to the step of measuring the part in need of repair, the specification states that measuring effort may be saved in not measuring features that were not subject to change over time, such as holes in a bulkhead that interface with other holes, such as on reinforcing panels or doublers. Specification, p. 8, lines 14-19. Thus, states the specification, data from the original design and manufacture may be used in place of measuring, by "adding additional manufacturing data to the measured data." Specification, p. 8, lines 19-20. The specification also states on p. 12, lines 6-8, that "original manufacturing and inspection data may be used as a starting point for each feature that a user wishes to measure in using the method of the present invention."

Thus, the claim term "adding additional data" has been defined in the specification as "adding original manufacturing or inspection data" for use in automatically manufacturing the repair part, and is used to save time in taking measurements, not in taking basic measurements as already required in Claims 1 and 12 of the present application.

In addition, the term "additional data" necessarily refers to the data not recited in Claims 1 and 12. That is, the "additional data" should not include data generated in measuring the structure, said data also used to automatically manufacture a repair part or a sheetmetal repair part. Additional data is necessarily not the data that was generated in measuring the structure, but as the specification teaches, other data or additional data, such as already existing data. Whatever "additional data" means, it cannot refer to the data that was already measured, nor can "additional data" refer to data required to orient the multi-axis digital measuring device, since that was already accomplished in Claim 1 or Claim 12.

Heier needs to orient four cameras and take measurements. Part of the process includes "position-measurement values" and "angular-measurement values," as stated in Heier, col. 5, lines 56-63. However, Heier states that the "position-measurement values" are part of the work piece image data, while the "angular-measurement values" correspond to orientations of the cameras. See Heier, col. 5, lines 49-63. Thus, the "position-measurement values" and "angular-measurement values," cited from Heier are not "additional data" but are part and parcel of the orienting step of Claim 1,"orienting a multi-axis digital measuring device," or of the measuring and data saving steps "measuring at least a portion" and "saving said data generated in measuring the structure".

Thus, Heier fails to disclose "adding additional data" as recited in Claims 2 and 13 of the application. The Office Action does not cite Richter for this limitation, only Heier. Since Heier does not teach or suggest adding additional data as reasonably construed, the references do not teach or suggest this limitation of Claims 2 and 13, and the rejection is improper. As already discussed above with respect to Claims 1 and 12, there is also no legally sufficient motivation for combining Richter and Heier, and the Office Action is incomplete for lack of an

analysis for a reasonable likelihood for success for the combination. Appellants submit that it was error to reject Claims 2 and 13 of the present application.

Claims 9 and 21

The rejection admits that Richter does not disclose translating data from a first format to a second format. Office Action, p. 3, lines 17 and 21-22. The Office Action also states that Heier discloses translating the data from a first format to a second format, in this case translating from a first format, stored calibration data and measurement data, to a second format, i.e., calculated coordinates of each point on the part. Office Action, p. 4, lines 6-9, citing Heier, col. 3, line 57, to col. 6, line 11.

Heier does not suggest the limitations recited in Claims 9 and 21. The claims specifically state a step of "translating" from one format to another format. The specification states specifically that application programs may use a translator between program languages, such as between Mastercam® and AutoCad®. Specification, p. 10, line 32, to p. 11, line 2. A word search of Heier does not find any form of the words "translate," "format," or "language," as in a programming language. The passages cited in Heier disclose calculation and manipulation of data, but do not teach or suggest translating the data from one format to another, such as between application programs. See Heier, col. 6, lines 4-11, stating

> The computer is therefore able, with algorithms of three-dimensional intersect (triangulation) known from photogrammetry, to unambiguously calculate the coordinates of each measured point on the object, using (i) the measured-angle values, (ii) stored calibration data, and (iii) measurement data delivered by the image-processing device.

A person of ordinary skill in CNC arts would recognize that "translating data" from a first format to a second format is different from manipulating data or using data in calculations.[4] Accordingly, neither Richter nor Heier teach or suggest a limitation of translating data from one format to a second format as required by the claims. In addition, as already discussed above for Claims 1-12, the Office Action and the Office Action is incomplete for failing to supply an adequate motivation for

combining the references, and for lack of an analysis for a reasonable likelihood for success for the combination. Claims 9 and 21 are therefore allowable and it was error to reject them.

Claims 3 and 14

Claims 3 and 14 are rejected under 35 U.S.C. § 103(a) as unpatentable in view of U.S. Pat. No. 5,913,555 to Karl-Hermann Richter et al. ("Richter") in view of U.S. Pat. No. 5,285,397 to Helmut Heier et al. ("Heier") and further in view of Appellants' appeal brief.

The Office Action admits that Richter and Heier fail to disclose the subject matter of Claims 3 and 14. The Office Action further admits that Appellants' first Appeal Brief in this case was filed on March 25, 2004. The present application was filed on May 11, 2001, approximately three years before the preparation of the Appeal Brief. Accordingly, the Appeal Brief cannot be used as prior art against this application.

Accordingly, Appellants submit the Office Action fails to make out a prima facie rejection against Claims 3 and 14. Appellants submit that the rejection of Claims 3 and 14 was in error and that Claims 3 and 14 are allowable.

Claims 8, 11, 19 and 22

The rejection states that Claims 8, 11, 19 and 22 of the present application were rejected under 35 U.S.C. § 103(a) over U.S. Pat. No. 5,913,555 to Karl-Hermann Richter et al.("Richter") in view of U.S. Pat. No. 5,285,397 to Helmut Heier et al. ("Heier") and further in view of U.S. Pat. No. 5,736,201 to Mary Flint ("Flint"). As for claims 11 and 22, The rejection states that Richter and Heier disclose all the claimed subject matter except for mounting a laser-scanning device on the multi-axis digital measuring device, wherein the laser is used to measure at least a portion of the structure with the multi-axis digital measuring device. The rejection states that Flint discloses "mounting a laser-scanning device, in order to record the topography

[4] *See Phillips v. AWH Corp.*, 75 U.S.P.Q.2d 1321, 1334-35 (Fed. Cir. 2005), stating that claim terms should be interpreted as a person of ordinary skill in the art would comprehend the terms.

of the object being scanned to produce a digitized signal, and that in Flint "[t]he laser is mounted on the multi-axis digital measuring device, wherein the laser is used to measure at least a portion of the structure with the multi-axis digital measuring device." Office Action, p. 6, lines 6-13.

Therefore, states the rejection, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to mount a laser-scanning device as taught by Flint on the multi-axis digital measuring device of Richter/Heier, wherein the laser is used to measure at least a portion of the structure with the multi-axis digital measuring device, in light of the teachings of Flint, in order to accurately record the topography of the object being scanned to produce a digitized signal. Office Action, p. 6, lines 18-22.

Thus, the given motivation to combine is that the laser of Flint would result in a digitized signal. Richter already uses a digitized signal, because he uses a digital imaging device, as admitted in the Office Action at p. 3, lines 2-4. Heier likewise uses digital cameras, as admitted in the Office Action at p. 4, line 1. Accordingly, Richter and Heier, using digital cameras, already produce digitized signals and would not be motivated to achieve a digitized signal via a laser. Therefore, there is insufficient motivation to combine Flint with either Richter or Heier. Since there must be some motivation or suggestion to combine the references, and there is none, the Office Action has not made out a prima facie rejection of Claims 8, 11, 19, and 22. In addition, the Office Action is incomplete for lack of an analysis for a reasonable likelihood for success for the combination The rejection of Claims 8, 11, 19 and 22 is therefore improper, and it was error to reject Claims 8, 11, 19 and 22.

VIII. Conclusion

In view of the above remarks, Appellants submit that the claimed invention is not unpatentably obvious over the references of record, and that the Office Action has not made out a sustainable case of obviousness for Claims 1-5, 7-16 and 18-22. Accordingly, Appellants request reversal of the rejections of Claims 1-5, 7-16 and 18-22 under 35 U.S.C. § 103(a). The reversal of all the rejections appears to be in order and is earnestly solicited.

Since the filing of this appeal brief constitutes a request to reinstate the appeal previously filed, no fee, other than a one-month extension of time, is believed to be due for filing this paper. The Commissioner is hereby authorized to charge payment of any additional filing fees required under 37 CFR § 1.16 and any patent application processing fees under 37 CFR § 1.17 associated with this communication or credit any overpayment to Deposit Account No. 23-1925.

Respectfully submitted,

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IX. Appendix Claims in the Application

1. (Original) A method for repairing a portion of a structure, comprising:
orienting a multi-axis digital measuring device;
measuring at least a portion of the structure with the device;
saving data generated in measuring the structure; and
using said data to automatically manufacture a repair part.

2. (Original) The method of Claim 1, further comprising adding additional data for use in automatically manufacturing the repair part.

3. (Original) The method of Claim 1, further comprising planning a process to manufacture the repair part.

4. (Original) The method of Claim 1, further comprising installing the repair part.

5. (Original) The method of Claim 1, further comprising orienting the device with respect to the structure via an orienting feature selected from the group consisting of plumb lines, orientation holes, a feature of the structure and a feature of the portion.

6. (Original) The method of Claim 1, further comprising mounting a mounting bracket for the multi-axis device on the structure.

7. (Original) The method of Claim 1, wherein automatically manufacturing comprises a multi-step process for material removal and material shaping.

8. (Original) The method of Claim 1, further comprising transferring the repair part from a first workstation to a second workstation.

9. (Original) The method of Claim 1, further comprising translating the data from a first format to a second format.

10. (Original) The method of Claim 1, further comprising a data manipulation step selected from the group consisting of exporting data, importing data, verifying data, and transferring data.

11. (Previously presented) The method of Claim 1, further comprising mounting a laser-scanning device on the multi-axis digital measuring device, wherein the laser-scanning device is used to measure at least a portion of the structure with the multi-axis digital measuring device.